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APPENDIX B

Air Quality Modeling Protocol

August 18, 2008
Kleinfelder Project No. 96248

Mr. Kevin Schilling
Airshed Dispersion Modeling Coordinator
Idaho Department of Environmental Quality
Air Quality Division
1410 N. Hilton
Boise, ID 83706

SUBJECT: AMBIENT AIR QUALITY MODELING PROTOCOL for CARGILL ENVIRONMENTAL FINANCE, ROCK CREEK TWIN FALLS, IDAHO

Dear Mr. Schilling:

Kleinfelder is preparing a Permit to Construct (PTC) application on behalf of Cargill Environmental Finance (Cargill) for Rock Creek Dairy located near Twin Falls, Idaho. The Project includes the installation of an anaerobic digester for processing onsite cow manure and two Genset electrical generators for conversion of the digester biogas to electricity. This modeling protocol is being submitted for approval to support the PTC application.

1 EXECUTIVE SUMMARY

The proposed anaerobic digester renewable energy system will result in criteria pollutant emissions of carbon monoxide, particulate matter, nitrogen oxides, sulfur dioxide and volatile organic compounds. Modeling will be performed for the criteria pollutants, to demonstrate compliance with the NAAQS.

The proposed project will also result in potential emissions of non-carcinogenic toxic air pollutants ("TAPs") listed in IDAPA 58.01.01.585 including acrolein, isomers of xylene, selenium, styrene, toluene, and trichloroethylene. The potential emissions of these compounds are not expected to exceed their respective listed TAP screening emission levels ("EL"). In addition, the digester will result in emissions of carcinogenic TAPs listed in IDAPA 58.01.01.586 including acetaldehyde, benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and vinyl chloride. The potential emissions for acetaldehyde and trichloroethylene are not expected to exceed the listed TAP EL, however potential emissions for benzene, dichloromethane, formaldehyde, nickel, and

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vinyl chloride may exceed each of the respective TAP ELs. Therefore, modeling is expected to be required for these specific TAPs to demonstrate compliance with the Acceptable Ambient Concentration (AAC) for each pollutant.

This ambient air quality modeling protocol ("protocol") is being submitted to the Idaho Department of Environmental Quality, Air Quality Division ("IDEQ") for review. The Protocol was prepared consistent with the IDEQ Air Quality Modeling Guidelines ("Guidelines"), revised December 31, 2002, and the associated modeling protocol checklist (see Appendix B). The protocol addresses the approach for assessing the ambient air impacts from the proposed source emissions for comparison with the AAC/AACC for TAPs and National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

We understand that IDEQ staff will review and approve the modeling protocol. If there are any questions or items of discussion, the following points of contact are available:

Cargill Environmental Finance:

Mr. Ryan Coleman
1410 Camelback Ln. Ste 229
Boise, Idaho 93702
(208) 345 -2324
e-mail: ryan_coleman@cargill.com

Kleinfelder:

Mr. Andy Marshall, P.E.
2315 S. Cobalt Point Way
Meridian, Idaho 83642
(208) 893-9700
e-mail: amarshall@kleinfelder.com

2 INTRODUCTION AND PURPOSE

2.1. General Overview

Cargill is proposing to construct an anaerobic digester renewable energy system at Rock Creek Dairy on leased space on the dairy's property. The anaerobic digester is an independent source separate of the dairy.

The facility operates under SIC code 4911. The digester is designed to produce biogas from on-site dairy cattle manure. The resulting biogas will be used as combustion fuel in two on-site generators that will be used for primary electrical production for the facility or sold to the local utility. The two generators can operate independently or simultaneously. A PTC application will be submitted in support of the permitting for this new air emission source.

Rock Creek Dairy is a minor source because the potential to emit is less than major source thresholds without requiring limits on its potential to emit.

The facility is located in Twin Falls County, Idaho which is designated as attainment or unclassifiable for criteria pollutants. The approximate center point of the property is located at 303661 northing and 1478522 easting. The surrounding area of the dairy is a sparsely populated, rural area with terrain at about 4,100 feet above mean sea level

(MSL). A Vicinity Map and a Site Location Detail Map are respectively provided as Figures A-1 and A-2 in Appendix A.

3 EMISSION AND SOURCE DATA

3.1. Facility Processes and Emission Controls Affected

The proposed source will allow for the production of electricity. Since this is Rock Creek Dairy's initial PTC, existing facility processes or emission controls will not be affected.

3.2. Emission Points and Future Emission Rates

An estimate of the potential emission rates for the proposed source is summarized in Table 3-1. Since this is a new source, the current emission rates for all of these pollutants are zero.

Table 3-1: Potential Emission Rates for Genset Generators

Pollutant	Genset PTE (Note 1) (tons/yr)	Flare PTE (Note 2) (tons/yr)
PM_{10}	0.9	0.7
SO_2 (Note 3)	9.6	65.5
NO_x	36.4	9.1
CO	99.4	18.3
VOC	8.3	32.9
Acetaldehyde	4.8E-03	4.8E-03
Acrolein	2.4E-03	2.4E-03
Benzene	6.3E-02	6.3E-02
Dichloromethane	9.2E-03	9.2E-03
Formaldehyde	1.7E-02	1.7E-02
Isomers of Xylene	1.2E-02	1.2E-02
Nickel	1.8E-04	1.8E-04
Selenium	1.0E-03	1.0E-03
Styrene	4.8E-03	4.8E-03
Toluene	2.4E-02	2.4E-02
Trichloroethylene	1.8E-03	1.8E-03
Vinyl Chloride	5.1E-03	5.1E-03

Note 1: PTE is calculated based on 8,760 hours/year of Genset engine operation.
Note 2: PTE is calculated based on 8,760 hours/year of flare operation.
Note 3: SO_2 PTE from the flare is calculated using raw un-conditioned biogas.

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There are two Genset electrical generators proposed to be installed adjacent to each other. The two generators have their own 12-inch (0.3048 meters) diameter stack extending 26 feet (7.93 meters) above ground. The flare is 20 feet in height (0.6096 meters) and is located after the H_2S scrubbing system. No limitation on the operation of the flare will be necessary to maintain the PTE of any criteria pollutant below major source thresholds. The emissions presented in Table 3-1 represent the total potential emissions if both of the generators were operating simultaneously, at capacity and if the flare was operating at capacity with unconditioned biogas.

3.3. Good Engineering Practice (GEP) Stack-height Analysis

The exhaust stack from the Genset generators is 26 feet (7.93 meters) in height. Because the stack height is less than 55 meters and is located in simple terrain, the GEP stack-height analysis requires the use of the actual stack height in calculating emission limitations.

3.4. Facility Layout

The facility layout is provided in Figure 2, Appendix A. As shown, the new planned anaerobic digester and biogas electrical generators will be located at the street address West of 2300 East 3450 North, Twin Falls, Idaho.

3.5. Source Parameters

The source parameters for the proposed anaerobic digester are summarized in Table 3-2. The stack velocity and stack temperature are estimates of average operating conditions.

Table 3-2: Source Parameters

Source Description	UTM E	UTM N	Stack Height (m)	Stack Diameter (m)	Stack Velocity (m/sec)	Stack Temp (Deg K)	Receptor Distance (m)
1-GE Jenbacher 416 1-GE Jenbacher 420	1478522	303661.8	7.93	.3048	25.34	743	30.5
1-Perennial Energy Flare	1478522	303661.8	6.096	n/a	n/a	n/a	30.5

3.6. Methodology for Including Emission Sources

The two proposed generator sources will be modeled as a single point source. In addition, the flare will be modeled as a separate point source since the flare will not be operating simultaneously with the generators.

3.7. Methodology for Including/Excluding Sources from the Modeling Analysis

No sources were excluded from the modeling analysis.

4 AIR QUALITY MODELING METHODOLOGY

4.1. Model Selection and Justification

The emission rates from the proposed source exceed the modeling thresholds for criteria pollutants requiring ambient air quality modeling for the proposed source. To properly demonstrate compliance with the ambient air quality standards, the SCREEN3 model was chosen to assess the potential air quality impacts from the project. This model was chosen since the facility consists of a simple terrain and simple and isolated emission sources. SCREEN3 uses worst case meteorological conditions to estimate worst case emission impacts.

4.2. Model Setup and Application

The SCREEN3 model will be set up following the EPA Guidelines and generally recommended procedures. The modeling options will be kept as regulatory default. The modeling parameter inputs for this modeling assessment are listed in Table 3-2.

4.3. Land-use Analysis

Following the land–use classification procedure provided in Appendix E of the IDEQ Modeling Guidelines, the area within 3km of the site has been classified as rural. The majority of the 3km radius around Rock Creek Dairy is largely agricultural or undeveloped, with the ground cover being mostly wild grasses, weeds and shrubs, and sparsely located trees.

4.4. Building Downwash

The regulatory building downwash option will be used in SCREEN3. The mechanical building nearest the Genset electrical generators has a height of 6.7 meters, a minimum horizontal dimension of 22.86 meters and a maximum horizontal dimension of 30.48 meters.

4.5. Terrain Options

The terrain surrounding Rock Creek Dairy is relatively flat. The surrounding terrain generally is not greater than the stack base elevation. Therefore, the flat terrain option will be selected for the model.

4.6. Choice of Meteorology

The full meteorology option will be selected as a worst case scenario for meteorological conditions. This includes all stability classes and wind speeds.

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4.7. Discrete and Automated Distance Options

The discrete distance option and the automated distance option will both be selected to model to the nearest public receptor and to find the maximum impact distance. If the maximum impact occurs beyond the leased property boundary, that value will be used in determining compliance with the National Ambient Air Quality Standards (NAAQS). The nearest receptor is 100 feet (30.48 meters). This is the minimum distance from the stack location to the leased property boundary.

4.8. Background Concentrations

Kleinfelder is proposing to use IDEQ's default background concentrations for rural/agricultural areas presented in Table 4-1.

Table 4-1: Background Concentrations for Criteria Pollutants

Criteria Pollutant	24-hr (ug/m3)	Annual (ug/m3)	1-hr (ug/m3)	8-hr (ug/m3)	3-hr (ug/m3)
PM_{10}	73	26			
NO_2	17				
SO_2	26	8	--		34
CO			3,600	2,300	

5 APPLICABLE REGULATORY LIMITS

5.1 Methodology for Evaluation of Compliance with Standards

The modeled concentration of criteria pollutants will be compared to the NAAQS to demonstrate that the facility impacts will not cause or contribute to an exceedance of the NAAQS. The compliance standards for criteria pollutants are summarized in Table 5-1.

Table 5-1: Applicable Standards for Criteria Pollutants

Criteria Pollutant	NAAQS 24-hr (ug/m3)	NAAQS Annual (ug/m3)	NAAQS 1-hr (ug/m3)	NAAQS 8-hr (ug/m3)	NAAQS 3-hr (ug/m3)
Total PM	--	--			
PM_{10}	150	--			
$PM_{2.5}$	35	15			
NO_2	--	100			

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SO_2	365	80	--		1,300
CO			40,000	10,000	
Lead					

SCREEN3 produces output for a one-hour average only. This one-hour average concentration must be adjusted to estimate the concentration for the appropriate averaging period. The one-hour average model output will be converted to averaging periods consistent with the standard for the pollutant modeled through the use of persistence factors presented in Table 5-2.

Table 5-2: Persistency Conversion Factors for SCREEN3

Averaging Period	Simple Terrain Conversion Factor
3- hour	0.9
8-hour	0.7
24-hour	0.4
Quarterly	0.13
Annual (Criteria)	0.08
Annual (Carcinogenic TAPs)	0.125

The modeled concentrations of the TAP emissions will be compared to their respective Acceptable Ambient Concentration (AAC) or Acceptable Ambient Concentration for Carcinogens (AACC), presented in IDAPA 58.01.01 Sections 585 and 586. The compliance standards for TAP emissions are summarized in Table 5-3.

Table 5-3: Applicable Standards for TAPs

TAP	AAC (ug/m3) 24-hr Avg	AACC (ug/m3) Annual Avg
Acetaldehyde		0.45
Acrolein	12.50	
Benzene		0.12
Dichloromethane		0.24
Formaldehyde		0.077
Isomers of Xylene	21,750	
Nickel		0.0042
Selenium	0.010	
Styrene	1,000	
Toluene	18,750	

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Trichloroethylene	13,450	0.77
Vinyl Chloride		0.14

5.2 Preliminary Analysis

The proposed project will result in potential emissions of non-carcinogenic TAPs listed in IDAPA 58.01.01.585, including acrolein, isomers of xylene, selenium, styrene, toluene, and trichloroethylene. The potential emissions of these compounds are not expected to exceed their respective listed TAP screening emission levels ("EL"). In addition, the digester will result in emissions of carcinogenic TAPs listed in IDAPA 58.01.01.586 including acetaldehyde, benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and vinyl chloride. The potential emissions for acetaldehyde and trichloroethylene are not expected to exceed the listed TAP EL, however potential emissions for benzene, dichloromethane, formaldehyde, nickel, and vinyl chloride may exceed each of the respective TAP ELs. Therefore, modeling is expected to be required for these specific TAPs to demonstrate compliance with the Acceptable Ambient Concentration (AAC) for each pollutant.

5.3 Full Impact Analysis

The full impact analysis will include an evaluation of the modeled impacts to ambient air quality using SCREEN3. If the maximum modeled concentrations exceed significant contribution levels, then the modeled impacts will be added to the respective background concentration for each pollutant and compared to the ambient air quality standards to show compliance.

5.4 Presentation of Results

The results of the air quality modeling assessment will be included in a detailed report, as an appendix to the Permit to Construct application submitted for the project. A summary of the results will also be included in the PTC application. We will follow the State of Idaho Air Quality Modeling Guidelines, dated December 31, 2002.

The report will include a detailed description of the source and the potential emissions, modeling methods and results. The modeling results will be presented in a tabular format for easy comparison to the applicable standards. The permit application will include documentation, and references for the engineering parameters used in the modeling assessment.

If you have any questions, please contact the undersigned at (208) 893-9700.

Sincerely,

KLEINFELDER WEST, INC.

Kelli Wetzel
Air Quality Engineer

Estee Lafrenz
Air Quality Engineer

Attachments:

References

Figures

Figure 1: Vicinity Map
Figure 2: Site Location Detail Map

Modeling Protocol Checklist

REFERENCES

EPA, 2000. *Meteorological Monitoring Guidance for Regulatory Modeling Applications*. EPA Publication No. EPA-454/R-99-005. U.S. Environmental Protection Agency, Research Triangle Park, NC.

EPA, 1995. *SCREEN3 Model User's Guide*. U.S. Environmental Protection Agency, Research Triangle Park, NC.

EPA's SCRAM Web site: http://www.epa.gov/scram001/index.htm.

IDAPA 58.01.01, et seq. *Rules for the Control of Air Pollution in Idaho.*

IDEQ, 2002. *State of Idaho Air Quality Modeling Guideline*, Doc. IDAQ-011 (rev. 1 12/31/02).

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Table A-1
Modeling Protocol Checklist for New Minor Sources or Minor Modifications

Checklist Item	Completed (yes / no)	Protocol Section
Introduction and Purpose	Yes	2
• General overview, facility description, terrain description	Yes	2.1
• Project Overview	Yes	2.1
• Goals of the air quality impact analysis (i.e., demonstrate compliance for a permit to construct or a Tier II operating permit)	Yes	2.1
• Applicable regulations and requirements	Yes	Exec Summary
• Pollutants of concern	Yes	Exec Summary
Emission and Source Data	Yes	3
• Facility processes and emission controls effected by the permitting action	Yes	3.1
• Include a list of emission points that will be included in the application. Present a table showing current actual and future allowable emission rates (in maximum pounds per hour tons per year) and the requested emission increase (future allowable minus current actual)	Yes	3.2
• Good engineering practice (GEP) stack-height analysis	Yes	3.3
• Facility layout: location of sources, buildings, and fence lines	Yes	3.4
• Source parameters (emissions rates, UTM coordinates, stack height, stack elevation, stack diameter, stack-gas exit velocity, and stack-gas exit temperature) for each new or modified emission point	Yes	3.5
• Methodology for including area and volume sources in the modeling analysis	Yes	3.6
• Methodology for including/excluding sources from the modeling analysis	Yes	3.7
Air Quality Modeling Methodology	Yes	4
• Model selection and justification	Yes	4.1
• Model setup and application - Model options (i.e., regulatory default) - *Terrain Options* - *Land-use analysis* - *Building Downwash* - *Choice of Meteorology* - *Discrete Distance Option*	Yes	4.2
• Elevation data - *Methodology for accounting for complex terrain*	n/a	

Table A-1 (Continued)
Modeling Protocol Checklist for New Minor Sources or Minor Modifications

Checklist Item	Completed (yes / no)	Protocol Section
• Receptor network - *Description of receptor grids – include methodology for ensuring the maximum concentration will be estimated* - *Discussion/justification of ambient air* - *Determination of receptor elevations*	Yes	4.7
• Meteorological data - *Selection of meteorological databases – justification of appropriateness of meteorological data to area of interest* - *Meteorological data processing* - *Meteorological data analysis (e.g., wind rose)*	Yes	4.6
• Background concentrations	Yes	4.8
Applicable Regulatory Limits	Yes	5
• Methodology for evaluation of compliance with standards (i.e., determination of design concentration)	Yes	5.1
• Full impact analysis - *TAPs analysis* - *NAAQS analysis*	Yes	5.1
• Presentation of results – state how the results of the modeling analysis will be displayed (i.e., list what information will be included)	Yes	5.1
References	Yes	attachment

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APPENDIX C

Modeling Protocol Approval Letter

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

April 19, 2008

Kelli Wetzel
Kleinfelder
Meridian, Idaho

RE: Modeling Protocol for Various Manure Digester Projects at Dairies in Idaho

Keilli:

DEQ received your dispersion modeling protocol on April 15, 2008. The modeling protocol was submitted on behalf of Andgar Corporation (Andgar). The modeling protocol proposes methods and data for use in an ambient air impact analyses in support of 15-day pre-permit construction approval Permit to Construct applications for construction of electrical generators, combusting biogas generated from manure digesters, at various dairies in Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: Approval of this protocol will be considered as an approved protocol for projects involving the operation of electrical generators, operated by Andgar, at Idaho dairies.

- Comment 2: Elevated Terrain. Review of the quadrangle map indicates the presence of substantially elevated terrain about ¼ mile west of the emissions sources. The submitted application must demonstrate that impacts to such areas will not cause or significantly contribute to a violation of any air quality standards. In situations where there are numerous ambient air locations within elevated terrain, AERMOD should be used.

- Comment 3: Downwash must be adequately accounted for. In the submitted protocol, it appears the mechanical building is the only building that could cause plume downwash (the stacks are not within a distance of 5L of any other building, where L is the lesser dimension of building height or projected width). For other applications, all buildings where the stack(s) are within 5L must be assessed to determine the controlling building with regard to building downwash. The controlling building is the one having the highest GEP stack height. GEP is given by $H = S + 1.5L$, where S is the building height.

In situations where there are numerous buildings that could contribute to plume downwash, AERMOD should be used to properly account for downwash.

- Comment 4: The application should provide documentation and justification for stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated or calculated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates. In cases where such parameters were verified by a system audit, the application should indicate how such parameters were verified (by direct measurement, by calculation, etc.). The actual calculation sheets are not required in most instances.

- Comment 5: Correction of persistence factor: Table 5-2 in the protocol provides persistence factors to use with SCREEN3. The annual factor for criteria pollutants was listed as 0.8. The correct factor is 0.08.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files are submitted with an analysis report. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

APPENDIX D

Emissions Calculations and Screen3 Output

Emission Calculations at Full Capacity
Rock Creek Dairy, Twin Falls, Idaho
One GE Jenbacher 416 & One GE Jenbacher 420 Genset Electrical Generators

Capacity Assumptions		
Gas generation	885,000	cf/day
Annual Gas consumption	323	MMcf/year
Heat value	565	Btu/cf
Hourly Btu input	20.83	MMBtu/hr
Annual BTU input	182,509	MMBtu/yr

Pollutant	Emission factor (lb/MMbtu)	Data Source	Emissions lbs/hr	tons/yr	grams/sec
PM10	**9.99E-03**	AP-42 Section 3.2, Table 3.2-2 (includes filterable and	0.21	0.91	2.6E-02
PM2.5	**9.99E-03**	condensible)	0.21	0.91	2.6E-02
SO2	1.05E-01	Vendor	2.18	9.55	2.7E-01
NOx	3.99E-01	Vendor	8.32	36.43	1.0E+00
CO	1.09E+00	Vendor	22.68	99.35	2.9E+00
VOC	9.07E-02	Vendor	1.89	8.28	2.4E-01
Lead	nd	Vendor			0.0E+00
Acetaldehyde	**5.30E-05**	EPA AP-42 Section 3.1, April 2000 (Rating D)	1.1E-03	4.8E-03	1.4E-04
Acrolein	**2.60E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	5.4E-04	2.4E-03	6.8E-05
Benzene	**6.90E-04**	Radian fire database 1993 release (Rating U)	1.4E-02	6.3E-02	1.8E-03
Dichloromethane	**1.01E-04**	Radian fire database 1993 release (Rating U)	2.1E-03	9.2E-03	2.6E-04
Formaldehyde	**1.90E-04**	EPA AP-42 Section 3.1, April 2000 (Rating D)	4.0E-03	1.7E-02	5.0E-04
Isomers of Xylene	**1.37E-04**	Radian fire database 1993 release (Rating U)	2.9E-03	1.2E-02	3.6E-04
Nickel	**2.00E-06**	EPA AP-42 Section 3.1, April 2000 (Rating D)	4.2E-05	1.8E-04	5.3E-06
Selenium	**1.10E-05**	EPA AP-42 Section 3.1, April 2000 (Rating D)	2.3E-04	1.0E-03	2.9E-05
Styrene	**5.26E-05**	Radian fire database 1993 release (Rating U)	1.1E-03	4.8E-03	1.4E-04
Toluene	**2.62E-04**	Radian fire database 1993 release (Rating U)	5.5E-03	2.4E-02	6.9E-04
Trichloroethylene	**2.00E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	4.2E-04	1.8E-03	5.3E-05
Vinyl Chloride	**5.60E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	1.2E-03	5.1E-03	1.5E-04

Total Emissions Compared to TAP Screening Els

Pollutant	Emissions lbs/hr	tons/yr	grams/sec	TAP Screening: TAP Screening EL (lb/hr)	Exceeds EL?
PM10	0.21	0.91	2.6E-02	Not applicable	
PM2.5	0.21	0.91	2.6E-02		
SO2	2.18	9.55	2.7E-01		
NOx	8.32	36.43	1.0E+00		
CO	22.68	99.35	2.9E+00		
VOC	1.89	8.28	2.4E-01		
Lead					
Acetaldehyde	1.1E-03	4.8E-03	1.4E-04	3.0E-03	No
Acrolein	5.4E-04	2.4E-03	6.8E-05	1.7E-02	No
Benzene	1.4E-02	6.3E-02	1.8E-03	8.0E-04	Yes
Dichloromethane	2.1E-03	9.2E-03	2.6E-04	1.6E-03	Yes
Formaldehyde	4.0E-03	1.7E-02	5.0E-04	5.1E-04	Yes
Isomers of Xylene	2.9E-03	1.2E-02	3.6E-04	2.9E+01	No
Nickel	4.2E-05	1.8E-04	5.3E-06	2.7E-05	Yes
Selenium	2.3E-04	1.0E-03	2.9E-05	1.3E-02	No
Styrene	1.1E-03	4.8E-03	1.4E-04	6.7E+00	No
Toluene	5.5E-03	2.4E-02	6.9E-04	2.5E+01	No
Trichloroethylene	4.2E-04	1.8E-03	5.3E-05	5.1E-04	No
Vinyl Chloride	1.2E-03	5.1E-03	1.5E-04	9.4E-04	Yes

Model Engine
Rock Creek Dairy, Twin Falls, Idaho

DEQ Background Concentrations For Rural Areas

Pollutant		Background Concentration (ug/m3)
PM10	24 hour	73
	Annual	26
SO2	3 hour	34
	24 hour	26
	Annual	8
NO2	Annual	17
CO	1 hour	3,600
	8 hour	2,300

Estimated Impacts Including Background Concentrations

Pollutant		Modeled Impact (ug/m3)
PM10	24 hour	79
	Annual	27
SO2	3 hour	164
	24 hour	84
	Annual	20
NO2	Annual	50
CO	1 hour	5,107
	8 hour	3,355

Pollutant	Averaging Period	Modeled Impacts ($\mu g/m^3$) (Note 1)	NAAQS or AAC ($\mu g/m^3$)
PM_{10}	24 hour	78.53	150
	Annual	27.11	50
$PM_{2.5}$	24 hour		35
	Annual	Note 2	15
NO_2	Annual	50.16	100
SO_2	3 hour	164.34	1,300
	24 hour	83.93	365
	Annual	19.59	80
CO	1 hour	5,107.23	40,000
	8 hour	3,355.06	10,000
Acetaldehyde	Annual	Below TAP EL	
Acrolein	24 hour	Below TAP EL	
Benzene	Annual	0.119	0.12
Dichloromethane	Annual	0.02	0.24
Formaldehyde	Annual	0.03	0.08
Isomers of Xylene	24 hour	Below TAP EL	
Nickel	Annual	0.0003	0.004
Selenium	24 hour	Below TAP EL	
Styrene	24 hour	Below TAP EL	
Toluene	24 hour	Below TAP EL	
Trichloroethylene	24 hour		
	Annual	Below TAP ELs	
Vinyl Chloride	Annual	0.01	0.14

Note 1 – Modeled Impacts for primary pollutants considers background concentrations.
Note 2 – Background for PM2.5 has not been established and modeled impacts could not be determined

Model Engine
Rock Creek Dairy, Twin Falls, Idaho

Persistency Factors	
3 hour	0.9
8 hour	0.7
24 hour	0.4
Annual criteria	0.08
Annual TAPs	0.125

Maximum SCREEN3 Impact using concentration input of 1 gram/sec (X/Q):
Model Results 527.40 (ug/m3)/(g/s)

One GE Jenbacher 416 & One GE Jenbacher 420 Genset Electrical Generators

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)
PM10	2.62E-02	1.38E+01
PM2.5	2.62E-02	1.38E+01
SO2	2.75E-01	1.45E+02
NO2 (Note 1)	7.86E-01	4.14E+02
CO	2.86E+00	1.51E+03
VOC	2.38E-01	Modeling not conducted
Lead	0.00E+00	
Acetaldehyde	1.39E-04	Emissions are below EL
Acrolein	6.83E-05	Emissions are below EL
Benzene	1.81E-03	9.55E-01
Dichloromethane	2.65E-04	1.40E-01
Formaldehyde	4.99E-04	2.63E-01
Isomers of Xylene	3.59E-04	Emissions are below EL
Nickel	5.25E-06	2.77E-03
Selenium	2.89E-05	Emissions are below EL
Styrene	1.38E-04	Emissions are below EL
Toluene	6.88E-04	Emissions are below EL
Trichloroethylene	5.25E-05	Emissions are below EL
Vinyl Chloride	1.47E-04	7.75E-02

Notes
1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)	1-hr average adjusted to 24 hr average	1 -hr average adjusted to annual average	1-hr average adjusted to 8 hr average	1-hr average adjusted to 3 hr average
PM10	2.62E-02	1.38E+01	5.53E+00	1.11E+00		
PM2.5	2.62E-02	1.38E+01	5.53E+00	1.11E+00		
SO2	2.75E-01	1.45E+02	5.79E+01	1.16E+01		1.30E+02
NO2 (Note 1)	7.86E-01	4.14E+02		3.32E+01		
CO	2.86E+00	1.51E+03			1.06E+03	
VOC	2.38E-01	Modeling not conducted				
Lead	0.00E+00	0.00E+00				
Acetaldehyde	1.39E-04	Emissions are below EL				
Acrolein	6.83E-05	Emissions are below EL				
Benzene	1.81E-03	9.55E-01		1.19E-01		
Dichloromethane	2.65E-04	1.40E-01		1.74E-02		
Formaldehyde	4.99E-04	2.63E-01		3.29E-02		
Isomers of Xylene	3.59E-04	Emissions are below EL				
Nickel	5.25E-06	2.77E-03		3.46E-04		
Selenium	2.89E-05	Emissions are below EL				
Styrene	1.38E-04	Emissions are below EL				
Toluene	6.88E-04	Emissions are below EL				
Trichloroethylene	5.25E-05	Emissions are below EL				
Vinyl Chloride	1.47E-04	7.75E-02		9.69E-03		

Notes
1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

Flare Emission Calculations
Rock Creek Dairy, Twin Falls, Idaho
Perennial Energy Flare

Capacity Assumptions		
Gas generation	885,000	cf/day
Annual Gas consumption	323	MMcf/year
Heat value	565	Btu/cf
Hourly Btu input	20.83	MMBtu/hr
Annual BTU input	182,509	MMBtu/yr

Pollutant	factor (lb/MMbtu)	Data Source	Emissions lbs/hr	Emissions tons/yr	Emissions grams/sec
PM10	**7.50E-03**	EPA RACT/BACT/LAER Clearinghouse (RBLC)	0.16	0.68	2.0E-02
PM2.5	**7.50E-03**	RBLC ID# IA-0088	0.16	0.68	2.0E-02
SO2	**7.17E-01**	Vendor	14.94	65.46	1.9E+00
NOx	**1.00E-01**		2.08	9.13	2.6E-01
CO	**2.00E-01**	EPA RACT/BACT/LAER Clearinghouse (RBLC)	4.17	18.25	5.3E-01
VOC	**3.60E-01**	RBLC ID# IA-0088	7.50	32.85	9.5E-01
Lead	nd				0.0E+00
Acetaldehyde	**5.30E-05**	EPA AP-42 Section 3.1, April 2000 (Rating D)	1.1E-03	4.8E-03	1.4E-04
Acrolein	**2.60E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	5.4E-04	2.4E-03	6.8E-05
Benzene	**6.90E-04**	Radian fire database 1993 release (Rating U)	1.4E-02	6.3E-02	1.8E-03
Dichloromethane	**1.01E-04**	Radian fire database 1993 release (Rating U)	2.1E-03	9.2E-03	2.6E-04
Formaldehyde	**1.90E-04**	EPA AP-42 Section 3.1, April 2000 (Rating D)	4.0E-03	1.7E-02	5.0E-04
Isomers of Xylene	**1.37E-04**	Radian fire database 1993 release (Rating U)	2.9E-03	1.2E-02	3.6E-04
Nickel	**2.00E-06**	EPA AP-42 Section 3.1, April 2000 (Rating D)	4.2E-05	1.8E-04	5.3E-06
Selenium	**1.10E-05**	EPA AP-42 Section 3.1, April 2000 (Rating D)	2.3E-04	1.0E-03	2.9E-05
Styrene	**5.26E-05**	Radian fire database 1993 release (Rating U)	1.1E-03	4.8E-03	1.4E-04
Toluene	**2.62E-04**	Radian fire database 1993 release (Rating U)	5.5E-03	2.4E-02	6.9E-04
Trichloroethylene	**2.00E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	4.2E-04	1.8E-03	5.3E-05
Vinyl Chloride	**5.60E-05**	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	1.2E-03	5.1E-03	1.5E-04

Total Emissions Compared to TAP Screening Els

Pollutant	Emissions lbs/hr	Emissions tons/yr	Emissions grams/sec	TAP Screening: TAP Screening EL (lb/hr)	TAP Screening: Exceeds EL?
PM10	0.16	0.68	2.0E-02	Not applicable	
PM2.5	0.16	0.68	2.0E-02		
SO2	14.94	65.46	1.9E+00		
NOx	2.08	9.13	2.6E-01		
CO	4.17	18.25	5.3E-01		
VOC	7.50	32.85	9.5E-01		
Lead					
Acetaldehyde	1.1E-03	4.8E-03	1.4E-04	3.0E-03	No
Acrolein	5.4E-04	2.4E-03	6.8E-05	1.7E-02	No
Benzene	1.4E-02	6.3E-02	1.8E-03	8.0E-04	Yes
Dichloromethane	2.1E-03	9.2E-03	2.6E-04	1.6E-03	Yes
Formaldehyde	4.0E-03	1.7E-02	5.0E-04	5.1E-04	Yes
Isomers of Xylene	2.9E-03	1.2E-02	3.6E-04	2.9E+01	No
Nickel	4.2E-05	1.8E-04	5.3E-06	2.7E-05	Yes
Selenium	2.3E-04	1.0E-03	2.9E-05	1.3E-02	No
Styrene	1.1E-03	4.8E-03	1.4E-04	6.7E+00	No
Toluene	5.5E-03	2.4E-02	6.9E-04	2.5E+01	No
Trichloroethylene	4.2E-04	1.8E-03	5.3E-05	5.1E-04	No
Vinyl Chloride	1.2E-03	5.1E-03	1.5E-04	9.4E-04	Yes

Model Flare
Rock Creek Dairy, Twin Falls, Idaho

DEQ Background Concentrations For Rural Areas

Pollutant	Background Concentration (ug/m3)
PM10	73
	26
SO2	34
	26
	8
NO2	17
CO	3,600
	2,300

Estimated Impacts Including Background Concentrations

Pollutant		Modeled Impact (ug/m3)
PM10	24 hour	74
	Annual	26
SO2	3 hour	227
	24 hour	112
	Annual	25
NO2	Annual	19
CO	1 hour	3,660
	8 hour	2,342

Pollutant	Averaging Period	Modeled Impacts ($\mu g/m^3$) (Note 1)	NAAQS or AAC ($\mu g/m^3$)
PM_{10}	24 hour Annual	73.89 26.18	150 50
$PM_{2.5}$	24 hour Annual	Note 2	35 15
NO_2	Annual	19.39	100
SO_2	3 hour 24 hour Annual	226.52 111.56 25.11	1,300 365 80
CO	1 hour 8 hour	3,659.64 2,341.75	40,000 10,000
Acetaldehyde	Annual	Below TAP EL	
Acrolein	24 hour	Below TAP EL	
Benzene	Annual	0.026	0.12
Dichloromethane	Annual	0.0038	0.24
Formaldehyde	Annual	0.007	0.08
Isomers of Xylene	24 hour	Below TAP EL	
Nickel	Annual	0.00007	0.004
Selenium	24 hour	Below TAP EL	
Styrene	24 hour	Below TAP EL	
Toluene	24 hour	Below TAP EL	
Trichloroethylene	24 hour Annual	Below TAP ELs	
Vinyl Chloride	Annual	0.0021	0.14

Note 1 – Modeled Impacts for primary pollutants considers background concentrations.
Note 2 – Background for PM2.5 has not been established and modeled impacts could not be determined

Model Flare
Rock Creek Dairy, Twin Falls, Idaho

Persistency Factors	
3 hour	0.9
8 hour	0.7
24 hour	0.4
Annual criteria	**0.08**
Annual TAPs	**0.125**

Maximum SCREEN3 Impact using concentration input of 1 gram/sec (X/Q):
Model Results 113.60 (ug/m3)/(g/s)

Perennial Energy Flare

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)
PM10	1.97E-02	2.24E+00
PM2.5	1.97E-02	2.24E+00
SO2	1.88E+00	2.14E+02
NO2 (Note 1)	2.63E-01	2.98E+01
CO	5.25E-01	5.96E+01
VOC	9.45E-01	Modeling not conducted
Lead	0.00E+00	
Acetaldehyde	1.39E-04	Emissions are below EL
Acrolein	6.83E-05	Emissions are below EL
Benzene	1.81E-03	2.06E-01
Dichloromethane	2.65E-04	3.01E-02
Formaldehyde	4.99E-04	5.67E-02
Isomers of Xylene	3.59E-04	Emissions are below EL
Nickel	5.25E-06	5.96E-04
Selenium	2.89E-05	Emissions are below EL
Styrene	1.38E-04	Emissions are below EL
Toluene	6.88E-04	Emissions are below EL
Trichloroethylene	5.25E-05	Emissions are below EL
Vinyl Chloride	1.47E-04	1.67E-02

Notes
1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)	1-hr average adjusted to 24 hr average	1 -hr average adjusted to annual average	1-hr average adjusted to 8 hr average	1-hr average adjusted to 3 hr average
PM10	1.97E-02	2.24E+00	8.95E-01	1.79E-01		
PM2.5	1.97E-02	2.24E+00	8.95E-01	1.79E-01		
SO2	1.88E+00	2.14E+02	8.56E+01	1.71E+01		1.93E+02
NO2 (Note 1)	2.63E-01	2.98E+01		2.39E+00		
CO	5.25E-01	5.96E+01			4.17E+01	
VOC	9.45E-01	Modeling not conducted				
Lead	0.00E+00	0.00E+00				
Acetaldehyde	1.39E-04	Emissions are below EL				
Acrolein	6.83E-05	Emissions are below EL				
Benzene	1.81E-03	2.06E-01		2.57E-02		
Dichloromethane	2.65E-04	3.01E-02		3.76E-03		
Formaldehyde	4.99E-04	5.67E-02		7.08E-03		
Isomers of Xylene	3.59E-04	Emissions are below EL				
Nickel	5.25E-06	5.96E-04		7.46E-05		
Selenium	2.89E-05	Emissions are below EL				
Styrene	1.38E-04	Emissions are below EL				
Toluene	6.88E-04	Emissions are below EL				
Trichloroethylene	5.25E-05	Emissions are below EL				
Vinyl Chloride	1.47E-04	1.67E-02		2.09E-03		

Notes
1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

H2S to SO2 Conversion
Rock Creek Dairy, Twin Falls, Idaho

Assumptions for gas stream entering Gensets:

- **350** ppm SO2 concentration
- **379** scf gas/lb-mole
- **34** Molecular weight of H2S
- **64** Molecular weight of SO2
- **10.24** scf/sec exhaust rate

$$\frac{350 \text{ cf H2S}}{1.00\text{E}+06 \text{ cf}} \times \frac{10.24306 \text{ scf}}{1 \text{ sec}} \times \frac{3{,}600 \text{ sec}}{1 \text{ hr}} \times \frac{1 \text{ lb-mole}}{379 \text{ scf}} \times \frac{34 \text{ mole}}{1} = \frac{1.16 \text{ lb H2S}}{\text{hr}}$$

$$\frac{1.16 \text{ lb H2S}}{1 \text{ hr}} \times \frac{64 \text{ mole SO2}}{34 \text{ mole H2S}} = \frac{\mathbf{2.18 \text{ lb SO2}}}{\mathbf{hr}}$$

Emission Factor

$$\frac{2.18 \text{ lb SO2}}{\text{hr}} \times \frac{\text{hr}}{20.83 \text{ MMBtu}} = \frac{\mathbf{0.105 \text{ lb SO2}}}{\mathbf{MMBtu}}$$

Assumptions for gas stream entering the Flare:

- **2,400** ppm SO2 concentration
- **379** scf gas/lb-mole
- **34** Molecular weight of H2S
- **64** Molecular weight of SO2
- **10.24** scf/sec exhaust rate

$$\frac{2{,}400 \text{ cf H2S}}{1.00\text{E}+06 \text{ cf}} \times \frac{10.24306 \text{ scf}}{1 \text{ sec}} \times \frac{3{,}600 \text{ sec}}{1 \text{ hr}} \times \frac{1 \text{ lb-mole}}{379 \text{ scf}} \times \frac{34 \text{ mole}}{1} = \frac{7.94 \text{ lb H2S}}{\text{hr}}$$

$$\frac{7.94 \text{ lb H2S}}{1 \text{ hr}} \times \frac{64 \text{ mole SO2}}{34 \text{ mole H2S}} = \frac{\mathbf{14.94 \text{ lb SO2}}}{\mathbf{hr}}$$

Emission Factor

$$\frac{14.94 \text{ lb SO2}}{\text{hr}} \times \frac{\text{hr}}{20.83 \text{ MMBtu}} = \frac{\mathbf{0.717 \text{ lb SO2}}}{\mathbf{MMBtu}}$$

09/21/08
16:04:18

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

C:\Lakes\ScreenView\dcd.scr

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE             =        POINT
   EMISSION RATE (G/S)     =      1.00000
   STACK HEIGHT (M)        =       7.9200
   STK INSIDE DIAM (M)     =        .3048
   STK EXIT VELOCITY (M/S)=       25.3400
   STK GAS EXIT TEMP (K)   =     743.0000
   AMBIENT AIR TEMP (K)    =     293.0000
   RECEPTOR HEIGHT (M)     =        .0000
   URBAN/RURAL OPTION      =        RURAL
   BUILDING HEIGHT (M)     =       6.7000
   MIN HORIZ BLDG DIM (M)  =      22.9000
   MAX HORIZ BLDG DIM (M)  =      30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.


BUOY. FLUX =    3.495 M**4/S**3;  MOM. FLUX =    5.881 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	306.1	4	8.0	8.0	2560.0	9.10	8.20	7.33	SS
200.	189.3	4	5.0	5.0	1600.0	12.56	15.56	10.36	SS
300.	137.4	4	4.5	4.5	1440.0	13.80	22.61	13.33	SS
400.	105.9	4	4.0	4.0	1280.0	15.43	29.45	16.27	SS
500.	86.17	4	3.5	3.5	1120.0	17.61	36.15	19.04	SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND   1. M:

33.	527.4	5	5.0	5.0	10000.0	8.67	2.25	3.76	SS

```
 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

********************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
   WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
********************************************


 *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2 ***
```

Screen3 engines

CONC (UG/M**3)	=	.0000	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	99.99	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	99.99	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	99.99	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	6.83	CAVITY HT (M)	=	6.73
CAVITY LENGTH (M)	=	24.96	CAVITY LENGTH (M)	=	21.61
ALONGWIND DIM (M)	=	22.90	ALONGWIND DIM (M)	=	30.50

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	527.4	33.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

09/21/08
16:06:45

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

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SIMPLE TERRAIN INPUTS:
   SOURCE TYPE            =      FLARE
   EMISSION RATE (G/S)    =    1.00000
   FLARE STACK HEIGHT (M) =     6.0960
   TOT HEAT RLS (CAL/S)   =   .145841E+07
   RECEPTOR HEIGHT (M)    =      .0000
   URBAN/RURAL OPTION     =      RURAL
   EFF RELEASE HEIGHT (M) =    10.1259
   BUILDING HEIGHT (M)    =     6.7000
   MIN HORIZ BLDG DIM (M) =    22.9000
   MAX HORIZ BLDG DIM (M) =    30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.


BUOY. FLUX =   24.181 M**4/S**3;  MOM. FLUX =   14.745 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

   DIST     CONC             U10M   USTK  MIX HT   PLUME  SIGMA   SIGMA
   (M)    (UG/M**3)   STAB   (M/S)  (M/S)   (M)    HT (M)  Y (M)   Z (M)  DWASH
 -------  ----------  ----   -----  -----  ------  ------  ------  ------  -----
     1.    .0000        1     1.0    1.0   320.0  243.55    1.96    1.92    NO
   100.   63.55         4    20.0   20.0  6400.0   14.30    8.32    9.37    HS
   200.   31.85         4    20.0   20.0  6400.0   17.22   15.73   12.76    HS
   300.   20.44         4    20.0   20.0  6400.0   19.67   22.80   15.99    HS
   400.   15.46         4    15.0   15.0  4800.0   25.40   29.79   19.24    HS
   500.   13.59         4    15.0   15.0  4800.0   25.40   36.42   22.07    HS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND     1. M:
    21.   113.6         4    20.0   20.0  6400.0   11.14    2.07    4.85    HS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

********************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
********************************************


 *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)      =    .0000        CONC (UG/M**3)      =    .0000
  CRIT WS @10M (M/S)  =    99.99        CRIT WS @10M (M/S)  =    99.99
```

Screen3 flare

CRIT WS @ HS (M/S) =	99.99	CRIT WS @ HS (M/S) =	99.99
DILUTION WS (M/S) =	99.99	DILUTION WS (M/S) =	99.99
CAVITY HT (M) =	6.83	CAVITY HT (M) =	6.73
CAVITY LENGTH (M) =	24.96	CAVITY LENGTH (M) =	21.61
ALONGWIND DIM (M) =	22.90	ALONGWIND DIM (M) =	30.50

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	113.6	21.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

APPENDIX E

Affidavit of Publication – Public Notice Meeting

Affidavit of Publication

STATE OF IDAHO)
COUNTY OF TWIN FALLS) SS.

I, Ruby Aufderheide, being first duly sworn upon oath, depose and say that I am Legal Clerk of the TIMES-NEWS,published daily at, Twins Falls, Idaho, and do solemnly swear that a copy of the notice of advertisement, as per clipping attached, was published in the regular and entire issue of said newspaper, and not in any supplement thereof, for one ~~consecutive~~ publication, commencing with the issue dated 9th day of October, 2008 and ending with the issue dated 9th day of October, 2008

And I do further certify that said newspaper is a consolidation, effective February 16, 1942, of the Idaho Evening Times, published theretofore daily except Sunday, and the Twin Falls News, published theretofore daily except Monday, both of which newspapers prior to consolidation had been published under said names in said city and county continuously and uninterruptedly during a period of more than twelve consecutive months, and said TIMES-NEWS, since such consolidation, has been published as a daily newspaper except Saturday, until July 31, 1978, at which time said newspaper began daily publication under said name in said city and county continuously and uninterrupted.

And I further certify that pursuant to Section 60-108 Idaho Code, Thursday of each week has been designated as the day on which legal notice by law or by order of any court of competent jurisdiction within the state of Idaho to be issued thereof Thursday is announced as the day on which said legal will be published.

Ruby Aufderheide
Ruby Aufdeheide, Legal Clerk

STATE OF IDAHO
COUNTY OF TWIN FALLS

On this 9th day of October, 2008, before me,

a Notary Public, personally appeared Ruby Aufdeheide, Ruby Aufderheide
known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Linda Capps-McGuire
Notary Public for Idaho
Residing at Twin Falls, Idaho.

My commision expires: 5-19-09

LINDA CAPPS-McGUIRE
NOTARY PUBLIC
STATE OF IDAHO

PUBLIC NOTICE

Cargill Environmental [illegible] has applied for an air quality Permit To Construct for an anaerobic digester located at 3441 North 2300 East in Filer, ID. An informational meeting will be held in the Hampton Inn located at 1658 Fillmore Street North in Twin Falls, ID at 4:00 pm on October 13, 2008.

PUBLISH: October 9, 2008

KLEINFELDER
Bright People. Right Solutions.

APPENDIX F

EPA letter regarding 40 CFR 60, Subpart JJJJ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

RECEIVED
APR 28 2008
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE A Q PROGRAM

APR 24 2008

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Jonathan Pettit
Air Quality Permit Analyst
Idaho Department of Environmental Quality
Air Quality Division
1410 N. Hilton
Boise, Idaho 83706-1255

Dear Mr. Pettit:

This is in response to your request for guidance regarding the use of Air to Fuel Ratio controllers (AFR) on lean burn and rich burn engines that are subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines at 40 CFR Part 60, Subpart JJJJ. Specifically, you request clarification of the provisions at 40 CFR Part 60, Section 60.4243(g) regarding: 1) whether use of an AFR is an enforceable requirement for engines that use three way catalysts; and 2) does the use of an AFR apply to both lean burn and rich burn engines that use three way catalysts.

Although not stated explicitly in 40 CFR Part 60, Subpart JJJJ, the use of an AFR is an enforceable requirement for rich burn engines that use three way catalysts. Question 10.2.2 in the 40 CFR Part 60, Subpart JJJJ Response To Comment document clarifies this requirement by stating that:

> An AFR is necessary and must be included with the operation of three way catalysts on rich burn engines and will have to be operated in an appropriate manner to ensure the proper engine operation and to minimize emissions.

Three way catalysts simultaneously reduce oxides of nitrogen (NO_X), hydrocarbons (HC) and carbon monoxide (CO) through a series of reduction and oxidation reactions for engines that operate at or near stoichiometric conditions. The AFR is necessary because it maintains the appropriate air to fuel ratio so that these oxidation and reduction reactions can take place in the catalyst. In their absence, the three way catalyst would not work properly, and the engine would be unable to consistently comply with the emission requirements specified in 40 CFR Part 60, Subpart JJJJ.

The provisions at 40 CFR Part 60, Section 60.4243(g) are not intended to apply to lean burn engines. This is because three way catalysts are designed to reduce HC, CO and NO_X emissions from engines that run at or near stoichiometric conditions and not from lean burn engines that operate at very lean air to fuel ratios and emit exhaust gases with high levels of excess air.

This response has been coordinated with the Office of General Counsel and the Office of Air Quality Planning and Standards. If you have any questions, please contact John DuPree of my staff at (202) 564-5950.

Sincerely yours,

Ken Giglielle

Kenneth A. Giglello, Acting Director
Compliance Assessment and Media Programs Division
Office of Compliance

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

1410 North Hilton
Boise, Idaho 83706-1253

RECEIPT

DATE: 101008

RECEIVED FROM: KLEINFELDER WESTERN

SOURCE: Cash ☐ Check ☒ Money Order ☐ No. 614525

DESCRIPTION	AMOUNT OF PAYMENT
	1000.00

RECEIVED BY: [signature]

TOTAL RECEIVED: 1000.00

PID	OBS	CA	SUB-OBJ	WP	BE

№ 82905